

Army Integrated Air and Missile Defense (AIAMD)



In FY22, the Army split the Army Integrated Air and Missile Defense (AIAMD) program IOT&E into two phases. The Army Test and Evaluation Command (ATEC) conducted IOT&E Phase 1 from January through March 2022. ATEC started IOT&E Phase 2 in August 2022 and expects to complete testing in October 2022. DOT&E will publish a final assessment of AIAMD operational effectiveness, suitability, and survivability in a classified report to inform the Full-Rate Production decision in 2QFY23.

SYSTEM DESCRIPTION

AIAMD is a command and control system that integrates Engagement Operations Centers (EOC), Sentinel air-surveillance radars, and Patriot missile-system radars and launchers across an integrated fire control network (IFCN). EOCs provide the operating environment for soldiers to monitor and direct sensor employment and the engagement of air threats. Hardware interface kits connect adapted Patriot and Sentinel components to the IFCN, either through an EOC or through an IFCN Relay. IFCN Relays also provide mobile communications nodes to extend fire control connectivity and distributed operations.

MISSION

Air Defense Artillery forces will use the AIAMD system to provide the timely detection, identification, monitoring, and (if required) engagement of air threats in support of active defense of the homeland, critical assets and locations, and forces.

PROGRAM

AIAMD is an Acquisition Category ID program, developing hardware using the Major Capability Acquisition Pathway and conducting agile software development using the Software Acquisition Pathway. DOT&E approved the Milestone C Test and Evaluation Master Plan in April

2019 and the IOT&E test plan in October 2021. The Army intends to enter full-rate production in 2QFY23. The program will integrate new and existing sensors and weapons in a series of future increments.

» MAJOR CONTRACTORS

- Northrop Grumman Systems Corporation – Huntsville, Alabama
- Raytheon Missiles and Defense – Huntsville, Alabama and Andover, Massachusetts
- Lockheed Martin Corporation – Dallas, Texas

TEST ADEQUACY

ATEC conducted a cybersecurity adversarial assessment (AA) from October through November 2021 at White Sands Missile Range, New Mexico, in accordance with the DOT&E-approved IOT&E test plan, and observed by DOT&E. The AA included both sustained live air and software/hardware-in-the-loop configurations, with electronic attack.

In January 2022, the Army split IOT&E into two phases due to known software deficiencies. ATEC completed IOT&E Phase 1 from January through March 2022 at White Sands Missile Range, New Mexico; including sustained live air; sustained software/hardware-in-the-loop with accredited modeling and simulation (M&S) tools; and two missile flight tests in accordance with the DOT&E-

approved IOT&E test plan, and observed by DOT&E.

ATEC started IOT&E Phase 2 in August 2022 with an updated and re-accredited M&S environment, after the program used the agile software development process to make incremental improvements to mitigate known software deficiencies. ATEC expects to complete the Phase 2 in October 2022, including sustained live air, sustained software/hardware-in-the-loop, and a third missile flight test. Only data collected during IOT&E Phase 2 will be used to evaluate integrated defense effectiveness.

PERFORMANCE

» EFFECTIVENESS

The Army conducted IOT&E Phase 1 with system limitations caused by known software deficiencies and additional deficiencies were discovered during testing. The program used agile software development to modify the software to mitigate some of these limitations prior to the start of IOT&E Phase 2. DOT&E will provide a final assessment of system operational effectiveness, predominately using data collected during IOT&E Phase 2, in a classified report to inform the Full-Rate Production decision scheduled for 2QFY23.

» SUITABILITY

DOT&E will provide a final assessment of system operational suitability, using data from IOT&E

Phase 1 and 2, in a classified report to inform the Full-Rate Production decision scheduled for 2QFY23.

» **SURVIVABILITY**

DOT&E will provide a final assessment of system survivability, using cybersecurity data collected from the AA and the FY21 cooperative vulnerability and penetration assessment, in a classified report to inform the Full-Rate Production decision scheduled for 2QFY23.

RECOMMENDATION

The Army should:

1. Develop an integrated suite of M&S tools to support follow-on testing of AIAMD with existing and future launchers, sensors, and other systems to provide operationally representative assessments of increasingly complex system-of-systems.